

REMARKS

Claims 1, 2, 5, 7, 8, 11, and 13-22 are pending in the present application.

At the outset, Applicants wish to thank Examiner Metzmaier for the helpful and courteous discussion with their undersigned Representative on April 10, 2006. During this discussion, the amendment to the claims presented herein was discussed. Applicants wish to thank the Examiner for indicating that this rejection would likely overcome the outstanding indefiniteness rejection. Reconsideration of the outstanding rejections is requested in view of the amendments and remarks presented herein.

The rejection of Claims 1, 2, 5, 7, 8, 11, 13, and 14 under 35 U.S.C. §112, second paragraph, is obviated by amendment.

Applicants have amended the claims to define the R groups in proper Markush form. As such, this ground of rejection is believed to be moot.

Withdrawal of this ground of rejection is requested.

The rejection of Claims 1, 2, 5, 7, 8, 11, 13, and 14 under 35 U.S.C. §103(a) over Naito et al (U.S. 5,292,799) is respectfully traversed.

In response to this ground of rejection, Applicants have requested that their undersigned Representative present their following arguments in traverse of the obviousness rejection over Naito et al:

“The characteristic of Naito’s patent (U.S. 5,292,799) is,

- (1) A solvent-free, cold-setting organosiloxane composition,
- (2) A ternary organosiloxane composition contains;

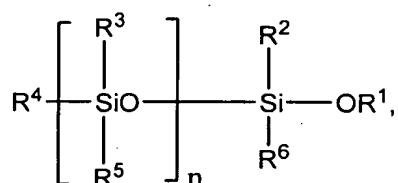
(A): liquid organopolysiloxane

(B): a cross-linking agent,

(C): a curing catalyst,

(3) Each compound is,

(A) liquid organopolysiloxane,



$\text{R}^1 = \text{H}, \text{C}_1 \rightarrow \text{C}_5,$

$\text{R}^2 \rightarrow \text{R}^6 = \text{H}, \text{OR}^1, \text{hydrocarbyl group},$

$\text{N} < 15,$

(B) a cross-linking agent,

$\text{R}^7_p\text{N}-(\text{OR}^1)_{3-p}, \quad \text{N:} \quad \text{Al, B.}$

$\text{R}^7_m\text{Q}-(\text{OR}^1)_{4-m}, \quad \text{Q:} \quad \text{Si, Ti, Zr.}$

(C) a curing catalyst,

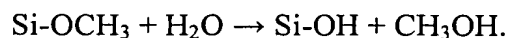
Here, as for the cross-linking agent (B), as shown in column 13, lines 60 to in column 14, lines 6, "It is an important feature of the cross linking agent (B) of the present invention that Al, B, Si, Ti or Zr in the organometallic compound is directly bound to Si-O bond constituting... The fact is quite important in attaining the objects of the present invention.

Therefore, the role of the cross-linking agent (B) is defined as the material required in order to give irregular structure partially to the main structure formed by polymerization of the main compound (liquid organopolysiloxane (A)).

Moreover, the role of the curing catalyst (C) is defined to make promote a cross-linking reaction with the cross-linking agent (B), described in column 15, lines 25-lines 28.

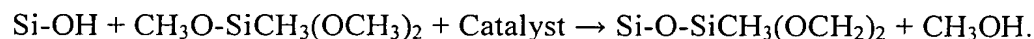
And the reaction mechanism of a ternary organosiloxane solution shown in the Naito's patent in column 13, lines 4-lines 20 is,

- (1) At first, methoxy group (-OCH₃) in the organosiloxane compound (A) is hydrolyzed to generate a silanol group (Si-OH).



(A) (A')

- (2) Next, the generating silanol group (A') and the cross-linking agent (B) together receive a de-alcohol reaction catalyzed by the curing catalyst (C).



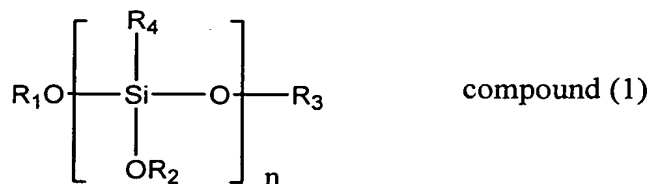
(A') (B) (C) (A'')

- (3) Finally, (A'') is polymerized to make a bridge construction.



On the other hand, the characteristic of the applicant patent (Application No. 09/874,055) is,

- (1) To a fiber material,
- (2) An alkoxysilane oligomer (n=2-8) consisting both of three hydrolyzable groups (-OR_{1,3}) and one unhydrolyzable group (-R₄) in the molecule is used as the main compound.



- (3) in addition, a hydrolyzable metallic compound is used as a catalyst, which hardens and solidifies the alkoxysilane oligomer (compound (1)) to make a polysiloxane bond (Si-O-Si).

Therefore, the coating solution of the applicant patent (Application No. 09/874,055) fundamentally consists of only two compounds, the alkoxysilane oligomer and the catalyst. There is no use of the cross-linking agent (B) being essential in the Naito's patent.

Why the applicant patent (Application No. 09/874,055) isn't necessary to consist of the cross-linking agent (B) is as follows. The characteristic of the main compound (compound (1)) used in this patent (Application No. 09/874,055) is that it is possessed, in one molecular, of,

- (1) Three hydrolyzable groups ($-\text{OR}_{1-3}$) \rightarrow generating a firm three-dimensional structure.
- (2) One unhydrolyzable group ($-\text{R}_4$) \rightarrow giving to coated materials good properties such as pliability, water repellence, and affinity with the fiber made by an organic material.

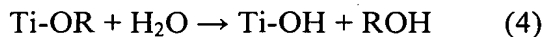
Consisting of two such different groups in one molecular, the main compound (1) of this patent shows the properties of generating the Si-O-Si bond which is a firm basic structure and of existence of the Si-R group which does not participate in making this bond and, therefore, gives pliability to the coated fibers.

That is, according to the patent (Application No. 09/874,055), the main compound (1) by itself can play a role of the organosiloxane compound (A) and the cross-linking agent (B) which are essential in Naito's patent.

This is the reason why this patent (Application No. 09/874,055) does not need to use the cross-linking agent (B).

Moreover, as for the reaction mechanism, in the case of the Naito's patent, the organosiloxane compound (A) is, at first, hydrolyzed, following to be reacted with the cross-linking agent (B) catalyzed by the curing catalyst (C). In the case of the applicant patent (Application No. 09/874,055), on the other hand, the catalyst is, at first, hydrolyzed to be Ti-

OH using water (eq. (4)) and then Ti-OH reacts with the main compound (1) (Si-OR) to generate Ti-O-Si bond (eq.(5)) following to be polymer as described in p.19 in this patent.



That is, two patents perfectly have the different reaction mechanisms to each other.

Based on the difference between the Naito's patent (U.S. 5,292,799) and the applicant patent (Application No. 09/874,055), the applicant wants to answer to the Examiner's comments.

Comments on p.3, No. 6 in Office Action,

(1) The characteristic of Naito's patent is that, as shown in column 13, lines 60 to column 14, lines 6, the role of the cross-linking agent (B) is defined as the material required in order to give irregular structure partially to the main structure formed of the organosiloxane compound (A). On the other hand, the characteristic of the applicant patent (Application No. 09/874,055) is that the unhydrolyzable group (-R₄) can be introduced into the base structure (Si-O-Si) by using the main compound (1). The existence of this group (-R₄) gives pliability to the base structure. Therefore, only using the compound (1), it is not necessary to use the cross-linking agent (B) of the Naito's patent.

(2) Fibers and textiles are, in fact, described in the Naito's patent. In addition to these substrates, the composition of the Naito's invention can be applied to various substrates relating to daily necessities, manufacturing industry, building or civil engineering industry and service industry (column 24, lines 42-lines 58).

On the other hand, the applied substrates in the applicant patent (Application No. 09/874,055) are restricted to what had a hydroxyl group in inside, such as paper and a fiber. Moreover, the polymer generated by the reaction using the compound (1) and the catalyst in

the patent (Application No. 09/874,055) grows up to be the best molecule structure around them. That is, the applied substrates are restricted to what are fiber-like materials having hydroxyl groups of cellulose in inside.

The mechanism of the reaction between the compound (1) and a hydroxyl group in cellulose was shown in p.34 in the applicant patent, in which the hydroxyl group (-OH) in a cellulose fiber and organosiloxane compound (Si-OH) reacted to each other to improve mechanical intensity.



Such a reaction mechanism is not described in the Naito's patent. Thus, the reaction mechanisms in both patents fundamentally differ and it can prove that two patents are completely different.

(3) Dimethyl dimethoxysilane shown in column 26, lines 33 et al is used as the cross-linking agent (B). The applicant used it not as the cross-linking agent but only in order to improve organic properties to the main structure (Si-O-Si) generated by the reaction of the compound (1).

That is, Dimethyl dimethoxysilane forms the main structure (Si-O-Si), together with the compound (1).

(4) Naito's patent limited the amount of the cross-linking agent (B) to less than 50%. However, as mentioned above, the compound (2) and compound (3) used in the applicant patent (Application No. 09/874,055) are not the cross-linking agent (B) but the components constructed in the main structure (Si-O-Si) to give organic property to it. This means that two patents are completely different on usage of Dimethyl dimethoxysilane.

(5) Moreover, in Naito's patent, liquid organopolysiloxane (A) is defined as $R/Si=1/3-2/2$ (Column 18, lines 34-40). On the other hand, in the applicant, patent (Application No. 09/874,055), the main compound (1) is $R/Si=2.5/1-3/1$. As to this R/Si ratio, it is obvious that both -the main compounds.(A) and (1) are perfectly different each other."


In view of the foregoing, Applicants submit that the present invention is not obvious in view of the disclosure of Naito et al.

Withdrawal of this ground of rejection is requested.

Applicants submit that the present application is now in condition for allowance.
Early notification of such action is earnestly solicited.

Respectfully submitted,

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